

# Fundamentals of Offshore Pipeline Engineering

## INTRODUCTION

- The majority of current and future offshore oil and gas explorations are conducted in deep waters. Offshore and subsea pipelines are a major asset in most offshore Oil & Gas operators. Ensuring its functionality, durability and effectiveness is a paramount operation and business requirement.
- This Fundamentals of Offshore pipeline Engineering training course identifies all subsea pipeline project phases including the design, fabrication, installation, inspection, maintenance, repair, and integrity management. The course focuses mainly on offshore pipelines.
- This 5-Day training course has been designed to cover all life cycle oil and gas offshore pipeline projects. This training course will give you the international insight of the subsea pipeline industry to enable you to retain your talent in order to ensure sustainable career growth. This is essential development for those who need to develop their knowledge and skills related to subsea pipeline design, installation, inspection and management.

This training course will highlight:

- Offshore pipeline design
- Fabrication and installation of subsea pipelines
- Pipeline inspection and repair
- Threats to integrity and safety
- Integrity management and maintenance of offshore pipeline
- Offshore pipeline installation and inspection challenges
- Umbilical, risers and flowlines design and installation
- Facility interface such as FPSO and FLNG

## OBJECTIVES

- This training course will help participants understand different aspects of offshore pipelines, risers and flowlines design, fabrication, installation, integrity, inspection, maintenance, and repair. By the end of this training course, participants will be able to:
- Maximize the economic value of the company by improving the knowledge of its employees about the design, installation, inspection, and repair of subsea pipelines
- Learn about offshore pipeline maintenance and integrity management
- Understand how offshore pipelines are designed
- Learn about the challenges of offshore pipeline installation
- Appreciate the different techniques of subsea pipeline inspection and repair
- Learn about offshore pipeline integrity management

## ORGANISATIONAL IMPACT

- This training course will effectively impact the organization by increasing the service life of its offshore pipeline projects, reduce the maintenance and operations cost and minimize the safety, environmental and business risks. The training course will further consolidate the following:
  - Requirements for offshore pipeline design and construction
  - Offshore pipeline integrity management
  - Protection, inspection, repair and maintenance of pipelines
  - Interface facility such as FPSO and FLNG

## PERSONAL IMPACT

- Upon successful completion of the training course, participants will be able to comprehend and effectively manage the challenges or obstacles encountered during the development of offshore pipeline projects within their organizations.
- This training course is very comprehensive and will address all phases of pipeline life cycle so that participants of any engineering discipline will have a rounded knowledge of the oil and gas subsea pipeline industry.

## WHO SHOULD ATTEND?

This training course is suitable for a wide range of professionals but will greatly benefit:

- Piping Engineers
- Pipeline engineers
- Operations Engineers and professions
- Maintenance engineers and technicians
- Project engineers
- Engineers from all disciplines who are new to the pipeline industry
- Managers and executives who are new to the offshore pipeline industry

## Course Outline

### Offshore Pipeline Design

- Offshore pipeline route selection
- Hydrodynamics around Pipes
- Expansion, Axial Creeping, Upheaval/Lateral Buckling
- On-bottom Stability
- Vortex-induced Vibrations (VIV) and Fatigue
- Corrosion Prevention
- Flow Assurance
- Hydrates

## Offshore Pipeline Installation, Inspection and Integrity Management

- Offshore pipeline installation methods
- Spiral Welded Pipes for Shallow Offshore Applications
- The effect of installation on offshore pipeline integrity
- Offshore Pipeline inspection, maintenance and repair
- Pipeline oil spill cleanup
- Offshore pipeline risk, corrosion and integrity management

## Integrity and Maintenance of Offshore Pipelines

- Integrity Management of Flexible Pipes
- Leak Detection Systems
- Risk Analysis for Subsea Pipelines
- Risk-Based Inspection
- Quantitative Risk Analysis
- Based RBI
- Consequences of Failure for Modeling for Oil and Gas Spills
- Environmental Impact Assessment

## Umbilical, Risers, Flowlines (Surf)

- Offshore Umbilical's, Risers + Flowlines (SURF)
- Offshore Umbilical Systems
- Design of Deepwater Risers
- Design codes
- VIV and Wave Fatigue of Risers
- Flexible Risers and Flowlines
- Hybrid Risers
- Drilling Risers

## Offshore Facility Interface

- Introduction to FPSO and FLNG facilities
- Interface Onboard FPSO or FLNG Facility
- FPSO and FLNG topside facilities and layout
- FPSO and FLNG operation, inspection and maintenance
- Regulations and Codes
- Environmental influences affecting FPSO – FLNG Operations
- FPSO and or FLNG Mooring system, Turret and Swivel
- Oil or Gas Transfer (Offloading) in FPSO and FLNG